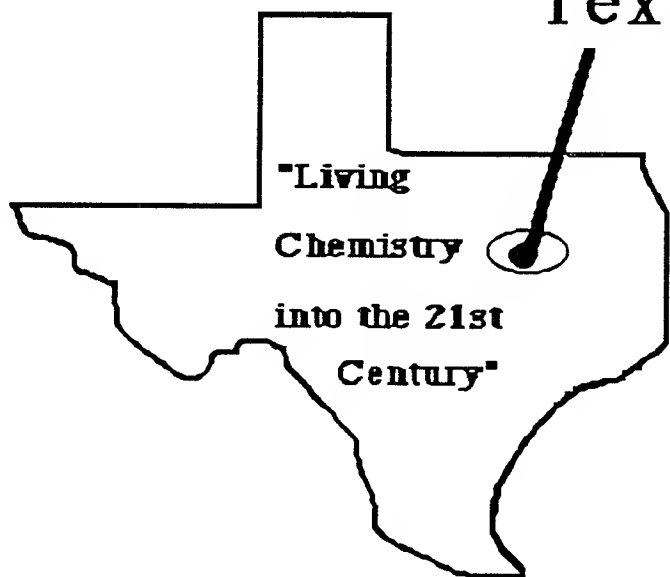


Program Schedule

# First Biennial ACT<sub>2</sub>-WELCH CONFERENCE

Texas Chemistry Teachers  
June 25 - 29, 1989



The Haggerty Center  
University of Dallas  
Dallas, Texas

AAT Accredited

## Table of Contents

	<u>Page</u>
1. General Information	1
2. TEA Approved Academic Credits	2
3. Program Schedule	
a. Sunday, June 25	4
b. Monday, June 26	5
c. Tuesday, June 27	7
d. Wednesday, June 28	9
e. Thursday, June 29	10
f. Friday, June 30	10
4. Abstracts	
a. Lectures	11
b. Workshops	13
c. Demonstrations	18
d. Contributed Papers	20
5. Scheduling Grid	25
6. Maps	26
7. List of Exhibitors	27
8. Conference Evaluation Form	28

## General Information

1. You may register on-site. Encourage all your friends and colleagues to attend!
2. Workshops will be registered for on-site.
3. Pre-purchased tickets for social events can be picked-up at registration.
4. You may purchase tickets for the various social events at time of registration.
5. You will be given your dorm room assignments at time of registration.
6. Important phone numbers:  
Emergency: 911  
Department of Chemistry: (214) 721-5067
7. Meal tickets will be available at registration.

## TEA APPROVED ACADEMIC CREDITS

TEA has assigned AAT credit to blocks of related sessions as shown below. TEA AAT credits will be earned by those who attend all sessions in any section(s) of their choice. Partial AAT credit will not be awarded—you must attend all sessions to receive any credit, for a block. In order to document your attendance at these sessions you will receive a registration card when you enter. Complete and sign and turn in as you leave. "Credit cards" will not be accepted later. The Conference administration will compile all "credit cards" and send you a certificate at the end of the Conference.

	<u>Individual Hours</u>	<u>Actual Credit</u>
<b>I. Chemical Demonstrations</b>		
Lecture: Shakhashiri (2L12a)		1.5
Workshop: choose one of the following for a minimum of		2.0
Introducing Students to Infrared Spectroscopy: Roe (2W33a)	2.0	
"Doing Chemistry" Videodisk: Brooks (2W21a,b,c)	2.0	
Demonstrations: choose two of the following for a minimum of		2.5
Chemistry Theater Technique: Walker (2D43a)	.5	
Dynamic Demos and Ideas for Motivating Chemistry Students: Hague (2D41a)	2.0	
Classroom Demonstrations: vanZandt (4D40a)	1.0	
Non-Spectacular Demonstrations which Effectively Illustrate a Concept: Schultz (5D42a)	1.0	
		<hr/> 6.0
<b>II. Chemistry for the Citizen</b>		
Lectures: Hill (3L13a)		1.5
Bent (2L11a)		1.5
Hansch (5L15a)		1.0
Workshop: choose one of the following for a minimum of		1.0
Culinary Chemistry: Judkins (3W24a,b)	2.0	
Eliminating Hazards in the High School Chemistry Lab: Valenzuela (3W25a)	1.0	
Contributed Papers: choose one of the following for a minimum of		1.0
Chemical Literacy (3P73a,b,c,d)	2.0	
Student Motivation (4P75a,b)	1.0	
		<hr/> 6.0
<b>III. Hands-on Chemistry</b>		
Contributed Papers:		
Laboratory Chemistry (3P74a,d)		1.5
Workshop: choose one of the following for a minimum of		3.0
Microchemistry Techniques: Dorsey (2W22a, 4W22b)	3.0	
Biochemistry Experiments Using Microchemistry Techniques: Dorsey (3W27a)	4.0	
Workshop: choose one of the following for a minimum of		2.0
Hands-on Spectroscopy in the Chemistry Lab: Schultz (2W23a, 3W23b)*	2.0	
Inexpensive Conductivity Apparatus: Puckett (3W30a)	2.0	
		<hr/> 6.5
<b>IV. Video Disks and Tapes</b>		
Lecture: Lagowski (4L14a)		2.0
Workshop: choose two of the following for a minimum of		4.0
"Doing Chemistry" Videodisk: Brooks (2W21a,b,c)	2.0	
The Periodic Table Videodisk in the Classroom: Banks (4W29a)	2.0	
Making Presentations and Interactive Lessons Using a Laser Disk Player and an Apple IIe: Roe (4W28a)*	2.0	
		<hr/> 6.0

## V. Remediation

Lecture: Shakhashiri (2L12a)		1.5
Workshop:		
Wasp-and-Beetle Model: Larsen (5W33a)		2.0
Contributed Papers: choose one of the following for a minimum of		2.0
Teaching to Motivate (2P71a,b,c,d)	2.0	
Reaching the Student (2P72a,b,c,d)	2.0	
Group Discussion: choose one of the following for a minimum of		1.0
Symposium: Views from My Classroom (4G60a)	1.0	
"Celebrity" Panel Discussion (5G61a)	1.5	
		<hr/> 6.5

## VI. Computers in Chemistry

Lecture: Lagowski (4L14a)		2.0
Workshop: choose one of the following for a minimum of		2.0
"Doing Chemistry" Videodisk: Brooks (2W21a,b,c)	2.0	
Apple Interfacing Devices: Dorsey (3W26a, 5W26b)	2.0	
Workshop: choose one of the following for a minimum of		2.0
Apple II Computer Interfacing Circuits On Breadboards: Roe (3W32a)	2.0	
Animating with a Macintosh: Telford (4W31a)	2.0	
		<hr/> 6.0

\* Fee: \$5.00

# SUNDAY, JUNE 25

TIME	EVENTS	LOCATION	AAT* Credit
1 - 5	Arrival Information Dorm Room Assignments Preregistration Packets Distribution Late Registration	Haggar University Center Foyer	
5 - 7	Dinner Cafeteria Open: 4:30 - 6		
7 - 10	Conference Warm-up Wine and Cheese Reception <i>MINI-WORKSHOP:</i>	Haggar University Center, balcony	
8 - 9	<i>Wne Making in the Classroom</i> Don Dorsey Michael Earsing	Private Dining Room H. U. C.	

\* Event for which AAT credit may be earned.

# MONDAY, JUNE 26

TIME	EVENTS	LOCATION	AAT* Credit
6:30 - 8	Breakfast		
7:30 - 8	Late Registration	Gorman Foyer	
8 - 8:30	Introduction Announcements Allen vanZandt J. J. Lagowski C. A. Wallace Award Welch Foundation Representative University of Dallas Representative	Lynch Auditorium	
8:30 - 10	Plenary Lecture #1 Approaching Excellence in ChemED Henry Bent, University of Pittsburgh	Lynch Auditorium	2L11a
10 - 3	Exhibits Trading Posts <i>Hospitality Suite</i>	Haggar Biology Lab <del>Haggerty 108</del> Gorman E Gorman Lounge	
10 - 10:30	Break		
	Workshops	<del>Gorman H</del>	
10:30 - 12:30	"Doing Chemistry" Videodisk David Brooks	Haggerty 2	2W21a
	Classroom Demonstrations		
11 - 11:30	Chemistry Theater Technique Mary Walker	Gorman B	2D43a
12 - 2	Lunch		

# MONDAY, JUNE 26

TIME	EVENTS	LOCATION	AAT* Credit
<b>Workshops</b>			
2 - 5	Microchemistry Techniques Don Dorsey	Haggerty 208	2W22a
2 - 4	"Doing Chemistry" Videodisk David Brooks	<del>Gorman H</del> Haggerty 2	2W21b
2:30 - 4:30	Introducing Students to Infrared Spectroscopy Robert Roe	Highland Park HS	2W33a
4 - 6	"Doing Chemistry" Videodisk David Brooks	<del>Gorman H</del> Haggerty 2	2W21c
4 - 6	Hands-on Spectroscopy in the Chemistry Lab Werner Schultz	Gorman F	2W23a
<b>Classroom Demonstrations</b>			
4 - 6	Dynamic Demos and Ideas for Motivating Chemistry Students George Hague	Gorman B	2D41a
<b>Contributed Papers: Teaching to Motivate</b>			
2:00	Chairperson: Mary Walker Super Science Camp for the Pre-High School Students George Hague	Gorman C	2P71a
2:30	ChemCom Update Jerry Mullins		2P71b
3:00	Targeting the Elementary Chemist Connie Hendrickson		2P71c
3:30	Team Teaching Quantities W/out Losing Qualities Helen Darden		2P71d
<b>Contributed Papers: Reaching the Student</b>			
4:00	Chairperson: Ruth Murphy Remedial Chemistry at the University Level John Judkins	Gorman C	2P72a
4:30	"Nonmajor" Chemistry at the Jr. College Connie Hendrickson		2P72b
5:00	Learning Styles Jean Placke		2P72c
5:30	A Collegiate Answer to Lesson Plans M. Lynne Hardin and Linda Hines		2P72d
6 - 7:30	Dinner		
7:30 - 9	<b>Plenary Lecture #2</b> Educating the Masses Bassam Shakhshiri, National Science Foundation	Lynch Auditorium	2L12a
9 - 12	<i>West End Tour, Dallas</i> (buses provided)	Dallas	



# TUESDAY, JUNE 27

TIME	EVENTS	LOCATION	AAT* Credit
6:30 - 8	Breakfast		
8 - 12	<i>Field Trip: The Science Place, Ramses</i> (buses provided)	Fair Park Dallas	
	<b>Workshops</b>		
9 - 11	Apple Interfacing Devices Don Dorsey	Gorman H	3W26a
9 - 11	Culinary Chemistry John Judkins	Haggerty 208	3W24a
9 - 11	Inexpensive Conductivity Apparatus Larry Puckett	Gorman F	3W30a
9 - 3	Exhibits Trading Post <i>Hospitality Suite</i>	Haggerty Biology Lab <del>Haggerty 108</del> Gorman E Gorman Lounge	
12 - 2	Lunch		
	<b>Contributed Papers: Chemical Literacy</b>		
	Chairperson: George Hague	Gorman C	
2:00	Novel AP Chemistry Larry Puckett		3P73a
2:30	AP Chemistry Jerry Mullins		3P73b
3:00	Interactions With University Chemistry Depts William Hendrickson		3P73c
3:30	A Summer Science Experience for Rural Youth Alton Banks		3P73d
4 - 4:15	Break		
	<b>Contributed Papers: Laboratory Chemistry</b>		
	Chairperson: Doris Warren	Gorman C	
4:15	Laboratory Safety and Chemical Waste Disposal Steven Barnes		3P74a
5:15	Formal Laboratory Reports Werner Schultz		3P74d

# TUESDAY, JUNE 27

TIME	EVENTS	LOCATION	AAT* Credit
	<b>Workshops</b>		
2 - 6	Biochemistry Experiments Using Microchemistry Techniques Don Dorsey	Haggerty 209	3W27a
2:30 - 4:30	Apple II Computer Interfacing Devices on Breadboards Robert Roe	Highland Park HS	3W32a
2 - 4	Culinary Chemistry John Judkins	Haggerty 208	3W24b
2 - 4	Hands-on Spectroscopy Chemistry Lab Werner Schultz	Gorman F	3W23b
4 - 5	Eliminating Hazards in High School Chemistry Sara Valenzuela	Gorman B	3W25a
6 - 7:30	Dinner		
7:30 - 9	<b>Plenary Lecture #3</b> Appreciation of Chemistry and Chemistry Educators John Hill, University of Wisconsin	Lynch Auditorium	3L13a
9 - 12	<i>Sing-a-long</i>	Gorman Lounge	

# WEDNESDAY, JUNE 28

TIME	EVENTS	LOCATION	AAT* Credit
6:30 - 8	Breakfast		
8 - 10	<b>Plenary Lecture #4</b> Computer-Assisted Chemistry Education for the 21st Century J. J. Lagowski, The University of Texas at Austin	Lynch Auditorium	4L14a
10 - 10:30	Break		
10 - 12	The Periodic Table Videodisc Alton Banks	Gorman B or Haggerty 2?	4W29a
	<b>Classroom Demonstrations</b>		
10:30 - 11:30	Classroom Demonstration Allen vanZandt	Gorman A	4D40a
10:30 - 11:30	<b>Symposium:</b> Views from my Classroom Mary C. Fields	Gorman C	4G60a
12 - 2	<b>Round Table Luncheon</b>	Cafeteria University Center	4S92a
2:00	Departure for Workshops at Highland Park High School		
2:00	<i>Field Trip: Highland Park High School</i> Robert Roe and Lawrence Puckett	Highland Park HS	
	<b>Workshops</b>		
2 - 5	Microchemistry Techniques Don Dorsey	Haggerty 208	4W22b
2:30 - 4:30	Making Presentations & Interactive Lessons Robert Roe	Highland Park HS	4W28a
2:30 - 4:30	Animating with a Macintosh Jason Telford	Highland Park HS	4W31a
	<b>Contributed Papers: Student Motivation</b>		
	Chairperson: Jerry Mullins	Gorman C	
3:00	Drug-Related Examples for Teaching Principles Ruth Murphy		4P75a
3:30	Exploring Research Instruction Chairperson: Doris Warren		4P75b
4 - 5:30	Dinner		
5:30 - 10	<i>Field Trip: The Omni Theater</i> (buses provided)	Ft. Worth	
10 - 12	<i>Hospitality Suite</i>	Gorman Lounge	

# THURSDAY, JUNE 29

TIME	EVENTS	LOCATION	AAT* Credit
6:30 - 8	Breakfast		
8:30 - 10	<b>"Celebrity" Panel Discussion</b> What do Texas Higher Education Institutions Want From Texas High School Chemistry Courses? Guests: Ed Heath, Russ Larsen, Larry Peck, Mamie Moy, Ben Hutchinson Jan Harris, Steve Ziser	Gorman A	5G61a
10:00	<i>Hospitality Suite</i>		
	<b>Workshops</b>		
10:30 - 12:30	Apple Interfacing Devices Don Dorsey	Gorman H	5W26b
10:30 - 12:30	Wasp-and-Beetle Model Russ Larsen	Gorman A	5W33a
	<b>Classroom Demonstrations</b>		
10:30 - 11:30	Non-Spectacular Demonstrations Which Effectively Illustrate a Concept Werner Schultz	Gorman B	5D42a
12 - 2	Lunch Dorm Check-out		
2 - 3	<b>Concluding Lecture #5</b> Teaching in the 21st Century--Getting Financial Support from Surrounding Industry Richard Hanschen, Chairman, Telpar, Inc.	Lynch Auditorium	5L15a
3 - 3:30	Closing Comments Allen vanZandt	Lynch Auditorium	

# FRIDAY, JUNE 30

TIME	EVENTS	LOCATION	AAT* Credit
7:30 - 8:30	Breakfast		
9 - 11	Special Meeting ACT <sub>2</sub> Officers	Gorman E	

## LECTURES

### Abstracts

**APPROACHING EXCELLENCE IN CHEMICAL EDUCATION.** Henry A. Bent, Department of Chemistry, University of Pittsburgh, Pittsburgh, Pennsylvania 15260.

Monday, June 26 8:30 a.m.

2L11a

Approaching excellence in chemical education requires understanding why we have chemical education. Why is chemistry in the curriculum? Because it gives us better things for better living? Because it helps us clean up the environment? Because it makes our nation more competitive economically? Because it strengthens national defense? Because it makes citizens better voters? No. Chemistry is in the curriculum because chemistry is a science. Approaching excellence in chemical education requires understanding what science is. The word "science" means "to know". To know how? By asking questions. What kind of questions? Questions that can be answered. Answered how? By observations plus logic. Produced by science is progress, i.e., an approach to excellence. Approaching excellence in education in the excellence that is science requires understanding what education is. Education is "communication of knowledge". Communication consists of three parts: presentation by a speaker to a listener of (1) an occasion that (2) compels in the speaker certain ideas and images with (3) evidence that that compulsion affects the speaker. In short, chemical education requires showing (1) what chemists do and see and (2) what chemists write and imagine (3) with enthusiasm! The reasons that that is difficult to do, and that that difficulty is the chief source of excellence in chemical education, will be discussed.

**EDUCATING THE MASSES.** Bassam Z. Shakhashiri, Assistant Director for Science and Engineering, National Science Foundation, 1800 G Street NW, Washington, DC, 20550.

Monday, June 26 7:30 p.m.

2L12a

(Abstract unavailable at time of printing).

#### **AN APPRECIATION OF CHEMISTRY AND CHEMISTRY INSTRUCTORS.**

John W. Hill, Department of Chemistry, The University of Wisconsin, River Falls, Wisconsin 54022.

Tuesday, June 27 7:30 p.m.

3L13a

Chemistry is an interesting and useful subject; these two descriptors need not be mutually exclusive. The theories of chemistry often exhibit an elegance and beauty that give great satisfaction, but it is the practical aspects of chemistry that are more likely to attract the beginning student. The most effective introductory chemistry courses integrate theory and application. The law of conservation of mass is the basis for stoichiometry, but it also limits our options for disposal of wastes. Chemical change can be discussed in practical terms to show how chemists can create wealth by converting base materials into useful products, for example, petroleum into plastics, pesticides, and polyester pants. Ignorance is not bliss; it is expensive. Policy makers ignorant of science make decisions that cost each of us thousands of dollars a year. Uninformed journalists have made fright one of our most important "industries". People fear "chemicals", but it is tobacco, alcohol, and failure to wear seat belts that kills them. Half of all high school chemistry teachers will retire over the next ten years. The United States faces an unprecedented challenge in educating their replacements and in producing a scientifically literate public.

#### **COMPUTER-ASSISTED CHEMISTRY EDUCATION FOR THE 21ST CENTURY.**

J. J. Lagowski, Department of Chemistry, The University of Texas at Austin, Austin, Texas 78712.

Wednesday, June 28 8:00 a.m.

4L14a

Over the years instruction covering the components of laboratory work--the heart of our science--has deteriorated badly, in some cases to the point of being detrimental to the perceived missions of chemical education, i.e., as a service function for other derivative disciplines and for the propagation of chemistry. The general deterioration often can be traced to logistical problems associated with space, knowledgeable people, and time. Modern technology in the form of video imagery and computing can be employed to alleviate some of the problems, when used judiciously. Thus, time can be compressed and/or expanded to the instructor's advantage; logistical constraints on the availability of equipment, consumables, and instrumentation often can be eliminated; and pedagogically superior instructional modes can be invoked to produce a richer laboratory experience with technological assistance than without. Examples will be provided from existing programs, and the implications thereof extrapolated to the future of laboratory instruction.

**TEACHING IN THE 21ST CENTURY--GETTING FINANCIAL SUPPORT FROM SURROUNDING INDUSTRY.** Richard J. Hanschen, 12102 Vendome Place, Dallas, Texas 75230.

Thursday, June 29 2:00 p.m.

5L15a

(Abstract unavailable at time of printing).

## WORKSHOPS

### Abstracts

**"DOING CHEMISTRY" VIDEODISK.** David W. Brooks, Center for Science, Mathematics, and Computer Education, University of Nebraska, Lincoln, Nebraska 68588, and H. B. Brooks, Synaps, Lincoln, Nebraska 68510.

Monday, June 26 11:00 Gorman Room H  
2W21a

Monday, June 26 2:00 Gorman Room H  
2W21b

Monday, June 26 4:00 Gorman Room H  
2W21c

Macintosh computers and HyperCard are used to develop interactive instruction. A wide range of systems will be demonstrated. Teacher-oriented materials include Doing Chemistry, an NSF-supported project of the ACS aimed at in-service chemistry teachers, and MicroScale, an inventory of downscaled high school experiments. Student systems include Six Solutions, a simulation with tutorials, and Titration, a simulation. A wide variety of teacher-tools will be demonstrated as well, many of which have immediate applications for the high school chemistry teacher.

**WOODROW WILSON WORKSHOP - MICROCHEMISTRY TECHNIQUES.** Don C. Dorsey, Jesuit College Preparatory School, 12345 Inwood Road, Dallas, Texas 75244.

Monday, June 26 2:00 Haggerty Room 208  
2W22a

In this workshop participants will learn how to use microplates, Beral pipets, and soda straws to fabricate familiar "hardware" used in microchemistry experiments. Several experiments from Microchemistry by Tom Russo and Steve Thompson will be performed. The twenty-five experiments in this manual can be integrated with any high school introductory course in chemistry. Two useful and safe devices, a conductivity indicator and an electric stirrer (using a Beral pipet), will be constructed by participants to take with them.

**INTRODUCING STUDENTS TO INFRARED SPECTROSCOPY.** Robert Roe, Jr., Highland Park High School, 4220 Emerson, Dallas, Texas 75205.

Monday, June 26 2:00 Highland Park High School  
2W33a

Experiments involving the motion of masses attached to springs are used to introduce students to infrared spectroscopy. The equation which can be derived from these experiments is compared to the equation that describes the quantized vibrational motion in molecules. Representative infrared spectra and models of chemical compounds are used to provide students with a qualitative understanding of infrared spectroscopy.

**HANDS-ON SPECTROSCOPY IN THE CHEMISTRY LABORATORY.** Werner W.Schulz, Highland Park High School, 4220 Emerson, Dallas, Texas 75229.

Fee: \$5.00

Monday, June 26 4:00 Gorman Room F  
2W23a

Tuesday, June 27 2:00 Gorman Room F  
3W23b

Spectroscopic techniques are widely used in the study of matter from the most basic level to the complex. The need to introduce students to some of the applications of spectroscopy has never been greater. The amount of time which can be dedicated to the teaching of spectroscopy is quite limited within the introductory chemistry curriculum. Thus, time-efficient experiments must be utilized. In this workshop, participants will perform experiments which introduce students to emission and absorption spectroscopy within the constraints of a 55-minute class period. The experiments are designed to lead the student to the recognition that spectra are comparable to "fingerprints" which can be clues to the identification of elements and compounds. In addition, spectroscopy aids in the understanding of electron configurations and quantum energy transitions. Participants will learn how to modify simple, commercial spectrometers and peripheral materials in order to achieve improved performance in spectral analysis.

**INEXPENSIVE CONDUCTIVITY APPARATUS.** Larry Puckett, Highland Park High School, 4220 Emerson, Dallas, Texas 75205.

Tuesday, June 27, 9:00 Gorman Room F  
3W30a

A simple, safe, inexpensive conductivity apparatus utilizing a 9-volt LED will be constructed and tested. A lab suitable for Chemistry I and II will be performed. This apparatus was developed at the 1986 Dreyfus Chemistry Workshop (Princeton).

**APPLE INTERFACING DEVICES.** Don C. Dorsey, Jesuit College Preparatory School, 12345 Inwood Road, Dallas, Texas 75244.

Tuesday, June 27 9:00 Gorman Room H  
3W26a  
Thursday, June 29 10:30 Gorman Room H  
5W26b

These devices will include a photosensor, thermoprobe, and a mass detection system. We will look at and use the CASL (Computer Assisted Science Labs), which consists of interactive software, RS 232 interface card, and connecting cable and card for an Ohaus electronic balance. A photometer designed by Tom Russo will be constructed and tested using the software, PHOTON.2. The Science Tool Kit by Bröderbund will be demonstrated.



**CULINARY CHEMISTRY.** John W. Judkins, Chemistry Dept., c/o Dr. J. J. Lagowski, The University of Texas at Austin, Austin, Texas 78712.

Tuesday, June 27 9:00 Haggerty Room 208  
3W24a

Tuesday, June 27 2:00 Haggerty Room 208  
3W24b

Student motivation is an important part of the recipe for teaching chemistry. The trick is to whip the student's interest in the subject into a lively foam while not skimping on the meat of the subject. This seminar will attempt to show that using cooking to teach some chemistry concepts is a fully baked idea. The talk will start off with a few tantalizing slices of culinary knowledge, followed quickly by a sample of a favorite activity. Finally, a discourse will be presented on how to use Culinary Chemistry to meet the Texas Essential Elements.

**APPLE II COMPUTER INTERFACING CIRCUITS ON BREADBOARDS.** Robert Roe, Jr., Highland Park High School, 4220 Emerson, Dallas, Texas 75205.

Tuesday, June 27 2:00 Highland Park High School  
3W32a

Computer interfacing circuits assembled and tested on bread boards require a minimum of time and knowledge of electronics and offer some educational advantages over hand-wired circuits. Participants will build circuits and perform chemistry and physics experiments using an Apple II computer interfaced to circuits on breadboards.

**WOODROW WILSON WORKSHOP - BIOCHEMISTRY EXPERIMENTS USING MICROCHEMISTRY TECHNIQUES.** Don C. Dorsey, Jesuit College Preparatory School, 12345 Inwood Road, Dallas, Texas 75244.

Tuesday, June 27 2:00 Haggerty Room 209  
3W27a

Wednesday, June 28 2:00 Haggerty Room 208  
4W22b

In this workshop three experiments using microchemistry techniques will be performed by participants. The three experiments are: "Biochemical Action of Catalase", "Sulfites in Foods", and "Iron in Cereals". These experiments were developed in a Woodrow Wilson Institute in the summer of 1988.

**ELIMINATING HAZARDS IN THE HIGH SCHOOL CHEMISTRY LAB.** Sara R. Valenzuela, Tom C. Clark High School, 5150 Dezavala Road, San Antonio, Texas 78249.

Tuesday, June 27 4:00 Gorman Room B  
3W25a

The Texas Hazard Communication Act has ensured that teachers are aware of the health and physical hazards of the chemical substances used in the high school laboratory. Teachers must now become familiar with the proper techniques for the disposal of hazardous materials that are produced in many popular chemistry labs. This workshop presents methods for dealing with such wastes and other leftover solutions. Lab activities accompanying state-adopted Chemistry I textbooks have been analyzed, and chemical substitutions and disposal options will be discussed. The proper treatment of waste  $\text{KMnO}_4$  solution from a redox titration lab will be demonstrated.

**THE PERIODIC TABLE VIDEODISC IN THE CLASSROOM.** Alton J. Banks, Department of Chemistry, Southwest Texas State University, San Marcos, Texas 78666.

Wednesday, June 28 10:30 Gorman Room B  
4W29a

The Periodic Table Videodisc offers an easy way to display the elements, their uses, and their reactions with air, water, acids, and bases. The videodisc will be demonstrated in both a stand-alone and a computer-interfaced mode. A discussion of necessary hardware and software will be included.

**MAKING PRESENTATIONS AND INTERACTIVE LESSONS USING A LASER DISK PLAYER AND AN APPLE IIe.** Robert Roe, Jr., Highland Park High School, 4220 Emerson, Dallas, Texas 75205.

Fee: \$5.00

Wednesday, June 28 2:00 Highland Park High School  
4W28a

Participants will use laser disk players and Apple IIe and Macintosh SE microcomputers to prepare presentations and interactive video lessons. Laser disks containing optical data from chemistry, physical science, physics, and other subject areas will be used by the participants.

**ANIMATING WITH A MACINTOSH.** Jason Telford, Department of Chemistry Southwest Texas State University, San Marcos, Texas 78666.

Wednesday, June 28 2:00 Highland Park High School  
4W31a

The use of Videoworks to create animations with the Macintosh computer will be shown. Participants will create several animated sequences of simple objects.

THE WASP-AND-BEETLE MODEL. STATISTICAL INSIGHT INTO HOW EQUILIBRIUM IS ACHIEVED AND THE MEANING OF AN EQUILIBRIUM STATE. R. D. Larsen, Department of Chemistry, Texas Tech University, Lubbock, Texas 79409.

Thursday, June 29 10:30 Gorman Room A  
5W33a

The Wasp-and-Beetle Model uses the apocryphal movement of  $N$  wasps between two rooms, according to certain rules, to simulate the mixing behavior associated with a spontaneous process. An equilibrium state is readily seen to be a mixed-up state. Many mixed-up states are possible. The difference between wasp microstates and macrostates is used to illustrate the implications for maximum entropy. A beetle walking on the edges of a cube is equivalent to the wasps-in-rooms model. The random "movement" of the wasps will be determined by classroom participation and then generalized by computer experiments.

## DEMONSTRATIONS

### Abstracts

MONDAY, JUNE 26 11:00 GORMAN ROOM B  
2D43a

**CHEMISTRY THEATER TECHNIQUE.** Mary H. Walker, James Bowie High School, 4109 Slaughter Lane, Austin, Texas 78749.

The technique of chemistry theater has been developed to aid junior high and senior high school students in visualizing atomic events. Students are invited to participate in acting out the parts of atoms and molecules as they go through a variety of chemical and/or physical changes. For example, an excellent way to illustrate the dipolar nature of a water molecule is to have all students in the room stand, arms extended at a rough approximation of the hydrogen-oxygen bond angle, and attempt to orient themselves with respect to their fellow water molecules' positive and negative poles. This particular example can be extended to include changes of state, colligative properties, and solvation theory. Examples of these techniques will be presented with videotape and with volunteers solicited from the audience.

MONDAY, JUNE 26 4:00 GORMAN ROOM B  
2D41a

**WOODROW WILSON WORKSHOP - DYNAMIC DEMONSTRATIONS AND IDEAS FOR MOTIVATING CHEMISTRY STUDENTS.** George R. Hague, Jr., St. Mark's School of Texas, 10600 Preston Road, Dallas, Texas 75230.

This workshop will present motivational demonstrations, ideas, and gimmicks that have been successfully used to boost interest and enrollments in high school chemistry. Demonstrations will include "The Electric Pickle", glass-blowing, soap bubble geometry, electricity from leftovers, and many more. The use of songs, music, cartoons, jokes, computer software, costumes, holiday activities, etc., will be covered in detail. When it comes to teaching chemistry, don't be inhibited! Learning chemistry is hard work, but it should also be fun! You are guaranteed to get a "Big Bang" out of this program.

WEDNESDAY, JUNE 28 10:30 GORMAN ROOM A  
4D40a

**CLASSROOM DEMONSTRATIONS.** Allen Van Zandt, Arlington High School, 818 West Park Row, Arlington, Texas 76013.

A light-hearted, fun-loving, and safe approach to teaching chemistry will be presented. Participants will take home many ideas to help make chemistry a more fulfilling course for both students and teachers. Ways to increase student participation will be discussed along with many sources of demonstrations. The objectives of this demonstration are to help students grasp the concepts of chemistry through demonstrations, to enable teachers to prepare easy, quick, and effective classroom demonstrations, and to make chemistry come alive for all.

THURSDAY, JUNE 29 10:30 GORMAN ROOM B  
5D42a

**NON-SPECTACULAR DEMONSTRATIONS WHICH EFFECTIVELY ILLUSTRATE  
A CONCEPT,** Werner W. Schulz, Highland Park High School,  
4220 Emerson, Dallas, Texas 75205.

It is relatively easy to capture the attention of students with flashy experiments. For some concepts it is difficult to come up with demonstrations that will get the point across. In this session, a series of brief demonstrations will be presented which have been found to be effective in illustrating concepts like covalent bonding, Brownian motion, molarity, metallic crystal structure, vapor pressure, volume measurement, and others. Instructions for each demonstration will be available.

## CONTRIBUTED PAPERS

### Abstracts

**MONDAY, JUNE 26**

**2:00 pm - 4:00 pm TEACHING TO MOTIVATE** Chair: Mary Walker

**2P71a**

**2:00 SUPER SCIENCE CAMP CHEMISTRY ACTIVITIES.** George R. Hague, St. Mark's School of Texas, 10600 Preston Road, Dallas, Texas 75230.

For the past four summers St. Mark's School of Texas has run a highly successful Science Camp for boys and girls ages 8 to 12. One of the camp's most popular programs has been a "Chemistry for Kids" session entitled "What's the Matter?" Activities have included hands-on experiments, demonstrations, songs, and games. An outline of the program will be presented.

**2P71b**

**2:30 CHEMCOM UPDATE.** Jerry D. Mullins, Plano Senior High School, 2200 Independence Parkway, Plano, Texas 75075.

This session is to present information and data which describes the effect of the ChemCom curriculum on high school chemistry students at Plano Sr. High School. This course was taught to 45 students during the 1988-89 school year. Current plans are to increase the student participation to approximately 125 students during the 1989-90 school year.

**2P71c**

**3:00 TARGETING THE ELEMENTARY CHEMIST.** Connie M. Hendrickson, Ar'kon Consultants, 2915 LBJ, Suite 161, Dallas, Texas 75234.

Those who will be chemists and other scientists in the 21st century are sitting in grade-school classrooms right now; how do we interest them in chemistry? "Kitchen Chemistry and Magic Shows" is a program designed for grades K-3. It was developed by the Dallas-Fort Worth Section of the ACS and presented to schools section-wide. Discussion will include structure of the program, special needs, and responses of the target audience.

**2P71d**

**3:30 QUANTITY WITHOUT LOSING QUALITY.** Helen Darden, Plano Senior High School, 2200 Independence Parkway, Plano, Texas 75075.

Team-teaching in chemistry at Plano Senior High School has assured the quality of chemical education for a large student population. Our student population has ranged from 220 to 400 enrolled in the regular Chemistry I class during any given year for the past 14 years. To meet the needs of the students and to maintain the integrity of the course, team-teaching has provided for the needs of the individual student and has assured that the material has been taught on a consistent basis across all classes. There are advantages and some disadvantages to the team-teaching approach, but the team of Plano Senior High School Chemistry I teachers has developed a process which diminishes the disadvantages and enhances the advantages for students and teachers.

MONDAY, JUNE 26

4:00 - 6:00 pm REACHING THE STUDENT Chair: Ruth Murphy

2P72a

4:00 REMEDIAL CHEMISTRY AT THE UNIVERSITY LEVEL. John W. Judkins, Chemistry Department c/o J.J. Lagowski, The University of Texas at Austin, Austin, Texas 78712.

Remedial education has become an extremely important part of the curriculum at high schools, colleges, and universities all around the country. There are numerous exemplary college and university programs around the country that have been successful at helping at-risk students. The talk will look at the practical and theoretical factors that make these programs successful.

2P72b

4:30 "NONMAJORS" CHEMISTRY AT THE TWO-YEAR COLLEGE. Connie M. Hendrickson, Ar'kon Consultants, 2915 LBJ, Suite 161, Dallas, Texas 75234.

The "nonmajors" chemistry course is designed for those students in health professions (nursing, respiratory therapy, etc.) and for those requiring a laboratory science elective. These students are traditionally "gun-shy" of chemistry and have little or no background in high school chemistry. How do you make such a course worth more than credit hours on a transcript?

2P72c

5:00 LEARNING STYLES AND LESSON PLANS. Jean E. Placke, Principal, Ursuline Academy of Dallas, 1900 Walnut Hill Lane, Dallas, Texas 75230.

Intuitively we know that each student learns differently. During the past twenty years, Drs. Rita and Ken Dunn have conducted research to give credibility to intuition. We now know there are four primary modes of learning--visual, auditory, tactile, and kinesthetic. The challenge is adapting our classrooms and teaching styles to accommodate these basically different learning styles. The secret is in consciously planning to meet the individual student's needs in our chemistry classrooms. A well-structured but flexible lesson plan is the key.

2P72d

5:30 A COLLEGIATE ANSWER TO LESSON PLANS. M. Lynne Hardin, and Linda K. Hines, Tarrant County Junior College - Northwest Campus, 4801 Marine Creek Parkway, Fort Worth, Texas, 76179.

Using a textbook-independent Course Information Document (CID) maximizes course content. How one designs such a CID and the finished project will be demonstrated. Typically, 80% of the students are successful in general chemistry, 90% in nursing chemistry. Our Northwest Campus students average above 50 percentile on ACS standard exams, scoring high in descriptive, thermodynamics, kinetics and equilibrium. These students also score well in structure and bonding.

**TUESDAY, JUNE 27**

**2:00 pm - 4:00 pm**   **CHEMICAL LITERACY**   Chair: George Hague

**3P73a**

**2:00 NOVEL AP CHEMISTRY.** Larry Puckett, Highland Park High School, 4220 Emerson, Dallas, Texas 75205.

Novel methods for teaching AP chemistry including Dreyfus developed labs will be presented. A student-produced chemical magic show will be discussed.

**3P73b**

**2:30 AP CHEMISTRY.** Jerry D. Mullins, Plano Senior High School, 2200 Independence Parkway, Plano, Texas 75075.

This session is designed for experienced AP teachers. The lab curriculum will be the main focus of the session with an emphasis on the skills, content, and techniques that should be emphasized. A series of core lab experiments will be presented along with possible student results. Experienced AP teachers who attend this session are strongly encouraged to bring examples of lab experiments which their students perform during the school year.

**3P73c**

**3:00 INTERACTIONS WITH UNIVERSITY CHEMISTRY DEPARTMENTS.** W.H. Hendrickson, Department of Chemistry, University of Dallas, Texas 75062.

The last few years have seen declining enrollments in the sciences. University professors are recognizing their responsibility to encourage high school students to become science majors. Some of the benefits that university and college teachers can provide--such as competitions, access to instrumentation, and demonstrations--will be discussed. The programs sponsored by the American Chemical Society, the International Chemistry Olympiad, and National Chemistry Week will also be covered.

**3P73d**

**3:30 A SUMMER SCIENCE EXPERIENCE FOR RURAL YOUNG SCHOLARS.** Alton J. Banks and Paul J. Fonteyn, Department of Chemistry, Southwest Texas State University, San Marcos, Texas, 78666.

A description of the National Science Foundation-sponsored Young Scholars Program at Southwest Texas State University is presented. The program was designed to select promising 7th grade and 8th grade students from the State of Texas and provide them with a four-week interdisciplinary study of the natural and physical sciences.



**TUESDAY, JUNE 27**

**4:00 pm - 5:30 pm    LABORATORY CHEMISTRY    Chair: Doris Warren**

**3P74a**

**4:00    LABORATORY SAFETY AND CHEMICAL WASTE DISPOSAL.**

**Steven S. Barnes, Corpus Christi State University, 6300  
Ocean Drive, Corpus Christi, Texas    78412.**

Corpus Christi State University is preparing a science in-service program with the ultimate goal of making every science laboratory and classroom in the state of Texas safer. It will teach general safety practices, with an emphasis on the safe handling, use, storage, and disposal of chemicals. The program is intended to be of use to all levels. The program will be divided into seven modules. Each module deals with specific aspects of safety. The modules make use of workbooks, videotapes, and a source book to present safety to the teacher. The modules include (1) An Introduction and Overview, (2) Safety Laws and Regulations, (3) Safety Practices in Teaching Science, (4) Safety Equipment Necessary for Science Laboratories, (5) Proper Storage of Chemicals, (6) Chemical Waste Disposal, and (7) First Aid. An overview of this program will be presented including the introductory videotape and a slide presentation on safe laboratory management.

**3P74d**

**5:00    FORMAL LABORATORY REPORTS.    Werner W. Schulz, Highland  
Park High School, 4220 Emerson, Dallas, Texas    75205.**

Evaluation of student performance in the laboratory is a difficult task. It is a common practice among teachers to grade work sheets in which the students fill in blanks with their observations and conclusions as they perform the experiments. However, in working with partners individual students' answers are not necessarily the result of their own effort. Furthermore, being guided through a series of questions, students may not grasp the overall concept and design of the experiment. In this presentation it will be shown how lab reports in the format of a scientific paper can help the student understand the scientific method and allow the teacher to evaluate creative and critical thinking of individual students. Grading such reports is time consuming for the teacher but worth doing once within each marking period. The format of the lab report has been helpful in science project presentations. Students have reported back that the skill of writing a lab report has given them an advantage in college.

WEDNESDAY, JUNE 28

3:00 pm - 4:00 pm STUDENT MOTIVATION Chair: Jerry Mullins

4P75a

**3:00 DRUG-RELATED EXAMPLES FOR TEACHING CHEMICAL PRINCIPLES.** Ruth A. Murphy, Department of Chemistry, Howard Payne University, Brownwood, Texas 76801.

The present widespread use of drugs, both licit and illicit, can provide many useful examples for teaching chemical principles and maintaining student interest. Discussions of acid-base chemistry can be enlivened with the chemistry of "freebasing," OTC-analgesics, antacids, and examples such as LSD, barbiturates, and amphetamines. The volatilities of ethers, alcohols, and inhalants can illustrate phase changes; cancer chemotherapy provides structure studies; and metal cations play a wide variety of therapeutic roles. Further examples involve periodic table relationships, compound purities, and solubilities. Sources of further information are given.

4P75b

**3:30 EXPLORING RESEARCH INSTRUCTION--BEYOND THE SCIENTIFIC METHOD.** Doris C. Warren, Department of Chemistry, Houston Baptist University, 7502 Fondren Road, Houston, Texas 77074.

In most introductory chemical curriculums today, the student is introduced to what research is all about, mainly with a presentation of the scientific method. From that point on, the "nitty gritty" of the "must" topics is explored and the sense of excitement about where a career in chemistry can lead quickly gets lost in theory and calculations. No wonder so many of our brightest students find chemistry tedious and boring. Today with the introduction of courses such as ChemCom in the high school and non-science majors courses in the university, we are beginning to address the problem. But what of our students on a chemistry majors track? The who, what, when and where of research in chemistry and chemically related fields can be introduced from current periodicals on an informal basis. Issues centering around points such as the characteristics of the researcher, integrity, and ethics in scientific research, planning and design of research projects, and identification of project flaws, along with dilemmas faced by researchers, can easily be discussed and will be examined in this paper.

**Scheduling Grid — ACT<sub>2</sub> — Welch Conference**  
**June 25-29, 1989**

	Sunday	Monday	Tuesday	Wednesday	Thursday
6					
7		Breakfast	Breakfast	Breakfast	Breakfast
8		Plenary Lecture #1		Plenary Lecture #4	Break Panel Discussion
9		Break			Break
10					
11	Arrival Information/ Registration	Lunch	Lunch	Round Table Luncheon	Lunch Check-Out
12					Concluding Lecture #5
1					Closing
2					
3					
4			Dinner		
5					
6	Dinner				
7	Conference Warm-up	Dinner	Dinner	The Omni Theater	
8		Plenary Lecture #2	Plenary Lecture #3		
9					
10		West End Tour Dallas	Sing-a-long		
11					
12					

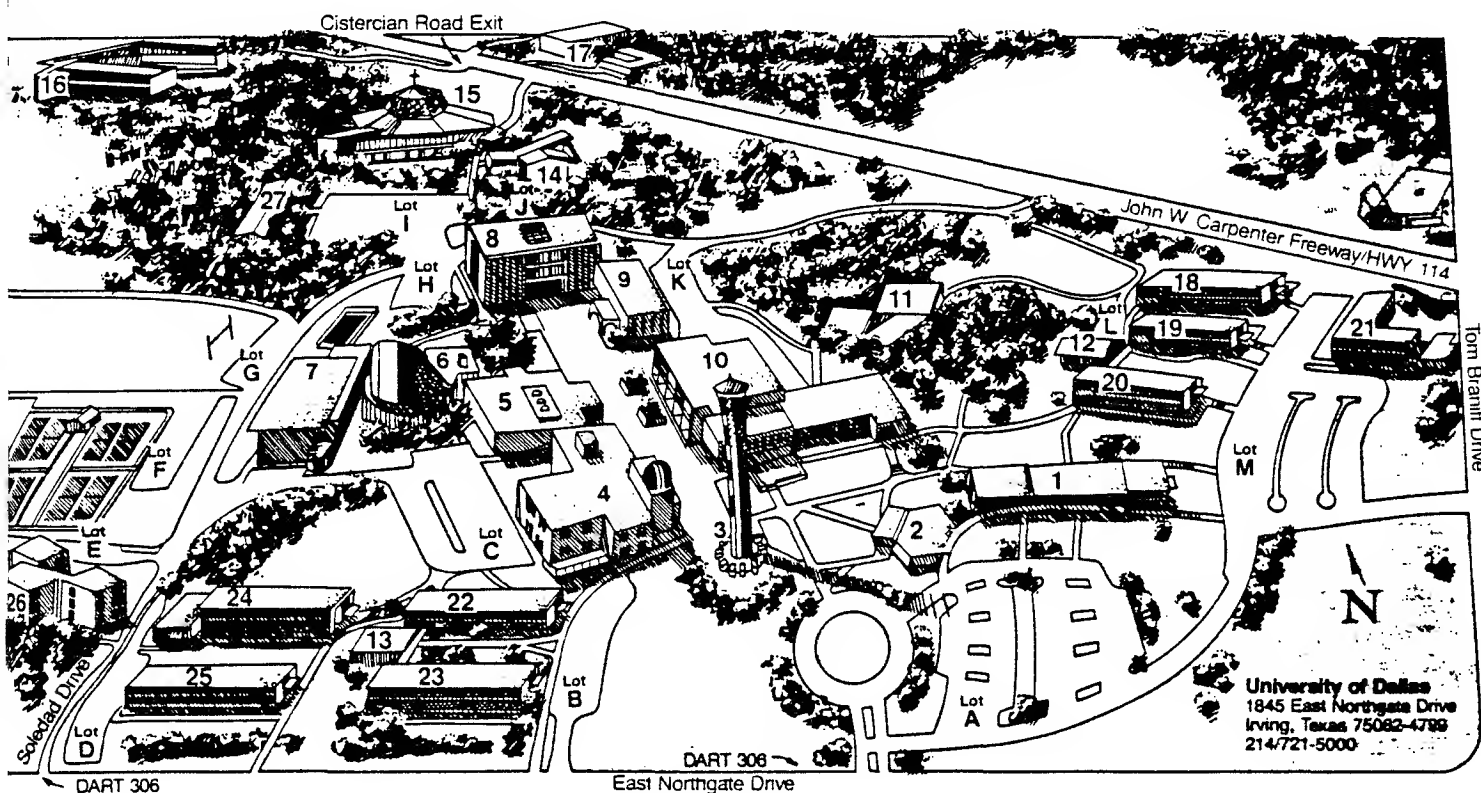
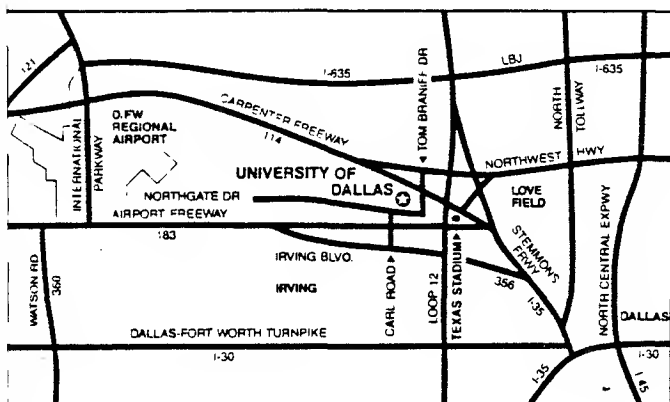
# CAMPUS MAP

The University of Dallas is a relatively young Catholic university with an enrollment of 2500 students. In our 32 years we have made quite a name for ourselves, along with a reputation for serious study.

Representative college guides consistently identify us as one of the most selective universities in the United States. We are one of the six top-rated Catholic colleges in the country, according to *Barron's Profiles of American Colleges and Universities*.

Our graduate programs in liberal arts and in management, founded respectively in 1966 and in 1967, also enjoy reputations for excellence.

Centrally located between Dallas and Ft. Worth, the UD campus occupies 744 acres next to Texas Stadium in Irving. This location offers our undergraduate population the entertainment and cultural advantages of a metropolitan setting, and our largely part-time graduate population easy access from all parts of the metroplex.



1. Carpenter Hall  
2. Lynch Auditorium  
3. Braniff Memorial Tower  
4. Patrick D. Haggerty Science Center

5. Gorman Lecture Center  
6. Chapel of the Incarnation  
7. Maher Athletic Center

8. Braniff Graduate Building  
9. Blakley Library  
10. Haggerty University Center

11. Haggerty Art Center  
12. Margaret Jonsson Theater  
13. Drama Building  
14. Dominican Priory

15. Holy Trinity Seminary  
16. GSM Administration Building  
17. Cistercian Abbey & Preparatory School

18-26 Residence Facilities  
Shipping and receiving, rear of Haggerty University Center, 3 (enter Lot K)

## LIST OF EXHIBITORS

**Flinn Scientific, Inc.**

P.O. Box 219  
Batavia, IL 60510

**GTE Southwest**

290 E. Carpenter Freeway  
Suite 700  
Irving, TX 75062

**Holt, Rinehart & Winston, Inc.**

8551 Esters Boulevard  
Irving, TX 75063

**Journal of Chemical Education**

Department of Chemistry  
University of Texas at Austin  
Austin, TX 78712

**Journal of Chemical Education Software**

Department of Chemistry  
Eastern Michigan University  
Ypsilanti, MI 48197

**Nalge Co.**

11843 Hillbrook Drive  
Houston, TX 77070

**Project SERAPHIM**

Eastern Michigan University  
Department of Chemistry  
Ypsilanti, MI 48197

# THE ACT<sub>2</sub>-WELCH CONFERENCE FOR HIGH SCHOOL CHEMISTRY TEACHERS

SPONSORED BY THE ROBERT A. WELCH FOUNDATION,  
THE CHEMISTRY DEPARTMENT, THE UNIVERSITY OF TEXAS AT AUSTIN,  
(ACT<sub>2</sub>) ASSOCIATED CHEMISTRY TEACHERS OF TEXAS  
JUNE 25-29, 1989

The organizers would like to have your opinion on this conference to evaluate their efforts and to form the basis of the next conference. Please return your completed evaluation before you leave the conference.

Please consider your evaluation from two points of view: your own personal growth (PG) and usefulness for your classroom teaching (CT).

Event	Ratings Scale					Didn't Attend
	1	2	3	4	5 best	
Field Trip	PG					
	CT					
Exhibits	PG					
	CT					
Trading Post	PG					
	CT					
List Workshops you attended by name:						
	PG					
	CT					
	PG					
	CT					
	PG					
	CT					
	PG					
	CT					
General Session Papers:						
	PG					
	CT					
	PG					
	CT					
	PG					
	CT					
	PG					
	CT					

Suggested Topics for future workshops:

---



---

PLEASE COMPLETE FORM AND LEAVE IT AT DESK BEFORE DEPARTURE.